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Public school systems infrequently project their financial outlook beyond the coming year. Yet, financial projections over a multiyear period are necessary if the financial "crises" that frequently occur in public organizations are to be avoided. This paper discusses the importance of financial forecasting and planning, the development of financial forecasts, a financial forecasting example, and additional planning steps. Suggestions are offered for implementing financial forecasting in school districts. (Author)

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Long Range Financial Forecasting for School Districts

by

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ABSTRACT

Public school systems infrequently project their financial outlook beyond the coming year. Yet financial projections over a multi-year period is a necessary step in effective planning to avoid the financial "crises" which frequently occur in public organizations. This paper discusses the importance of financial forecasting and planning, development of financial forecasts, a financial forecasting example, and additional planning steps. Suggestions are offered about implementing financial forecasting in school districts.

1.0 Introduction

This paper was prepared as a stimulus to the implementation of financial forecasting in public school systems. A basic premise of the author is that financial forecasting, two to ten years into the future, is instrumental to effective school system management. While other public sector organizations are increasingly performing financial planning, school districts work almost exclusively with next year's budget as the only financial forecast. This lack of planning has caused and will continue to cause financial crises for many school systems. Planning provides a basis for taking actions to avoid, or at least to minimize, a future crisis.

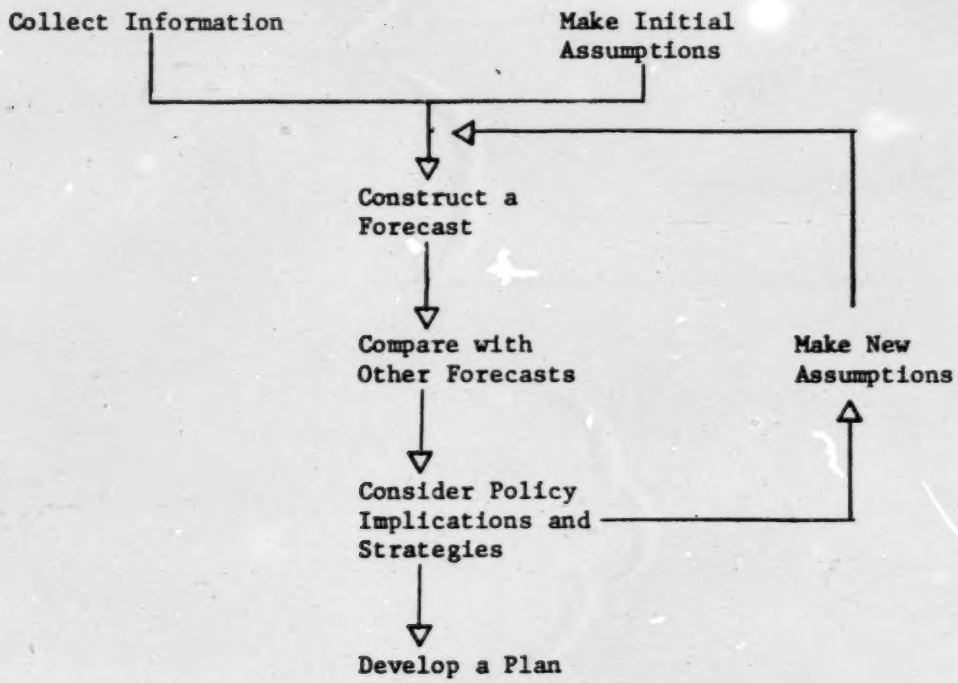
In addition to being an important step, the implementation of financial forecasting in a school district is feasible within the existing state-of-the art of forecasting and with the present level of sophistication of school system managers. Those interested in pursuing this topic as a result of reading this paper should contact the Educational Management Development Center.

2.0 Planning Process and Concepts

Planning involves making decisions about future actions. Figure 1 outlines the basic planning process.

Figure 1

Stages in the Planning Process



The purpose of planning is to improve decisions about future actions. The basic advantage of engaging in planning is that the central policy issues are illuminated while the decision maker is forced to explicitly state, and examine, assumptions about the future. Some of the important concepts involved in this planning will be briefly reviewed next.

One of the primary planning concepts is that of making assumptions. An assumption is a statement about a likely or possible event in the future. Examples of assumptions are:

- School district enrollment will decrease 12% by 1980
- School district assessed valuation will increase 8% by 1980.

When assumptions are stated about future events and relevant information is collected, forecasts, or projections, can be developed. For example, if one makes assumptions about the number of teachers employed by a school district in the future and about the inflation rate for teachers' salaries, then the cost of teacher salaries for some future year can be calculated, or forecast.

Two points should be emphasized. First, there is no escape for the school administrator from having to make assumptions, but systematic planning offers a means of examining and exploring these assumptions. Second, forecasting is not prediction, but rather an enumeration of potential outcomes, given the realization of a certain set of assumptions.

The result of the planning process, as outlined in Figure 1, is a plan of action for school administrators in order that more desired future outcomes can be reached. Thus, the planning process is directly related to administrative functions. Therefore, while school administrators can use technical and clerical assistance in preparing forecasts, the administrators must be involved in making assumptions, reviewing forecasts, considering policies and strategies, and in developing a plan. In the remainder of this paper, financial forecasting will be reviewed as an example of a major planning activity.

3.0 Financial Forecasting Fundamentals

School system administration should be concerned with financial forecasting for two reasons:

1. It is explicitly required at certain times. Financial forecasts must be prepared as a portion of a district's long range plan submitted to the Pennsylvania Department of Education. The Department also requires a forecast as part of the application form submitted when a school district wants to construct a new building. It is likely that the number of situations in which financial forecasts are required will increase in the future.

2. It is a planning tool. Financial forecasts may be used for planning concerning two types of situations: controllable and uncontrollable. Controllable refers to situations which the school district can influence such as determining the pupil/teacher ratio for a particular year. Uncontrollable situations are those for which the school district has little or no influence such as the rate of housing development and occupancy in the school district during a particular time period. The examples of staffing patterns and community development both involve future events for which financial forecasting is an important concern in determining school district plans and actions.

Other situations could be cited. Of course, it should be emphasized that financial forecasts will only be one of a variety of factors taken into account when arriving at important decisions.

There are two elements necessary to establishing a financial forecasting capability. The first element is a procedural design (or methodology) to be used in preparing forecasts. The methodology must be able to integrate information from a variety of factors which affect the school district's financial future, such as enrollment, revenue bases, and inflation. The second element is a data base to provide the information required by the methodology to construct forecasts. Following is a list of important factors in developing financial forecasts and an indication of data sources.

District Development Patterns. The development patterns in a school district affect population which in turn affects the provision of school services and a portion of revenues. Information on population, income levels, and property development can be obtained from sources like utilities and public planning agencies. These organizations make projections as well as having current statistics.

Enrollment. Enrollment by grade level is a central concern of school district planning. Enrollment can be projected by two major methods. One method is to make the projection on the basis of community demographics. This assumes that a community with certain characteristics (people in different age groups and income levels, percentage of home owners) could be estimated to enroll certain numbers of students in different grades. Another method is to calculate next year's enrollment on the basis of this year's enrollment and in turn calculate the enrollment two years from now on the basis of next year's enrollment, and so forth. Both of these methods assume that particular groups of families or children will result

in a certain enrollment rate of students based on the previous history of a school district or similar school districts. Future population trends and public/non-public school enrollment rates are important factors in estimating future enrollment. The choice of a particular projection technique depends upon the school district's planning resources available and the precision required of the projections.

Public Law. A variety of state and federal regulations affect school system operations. Changes in these regulations, including the addition of new ones, can have substantial impacts on a school district budget. Pennsylvania Act 392, concerning the bussing of non-public school students is one example of a recent enactment with such an impact for some districts. The trend in Pennsylvania for more mandated special education is another example.

Tax and Reimbursement Rates. These rates have an obvious impact on school district revenues. While a school district sets its own level for property taxes and income taxes (if any), previous taxing levels and taxing rates of other local government units will probably influence school district taxing policy. The state reimbursement rate is an important revenue source but may be difficult to predict for future years.

Personnel Contracts and Requirements. Salaries are the most significant portion of a school district budget. Generally salaries are determined by negotiations, with the rates enumerated in a written contract for a given period of time. These rates coupled with estimates of the number of personnel at each rate level determine the salary expenditure. (Non-negotiated salaries may be determined by the same method, as a rate structure usually exists for these positions. These projections should include anticipated

cost of living and merit increases, if any.) The number of personnel required in a particular year will depend upon the program level at which the school system will operate. The pupil/teacher ratio and number of school buildings are especially important factors in that determination. Since experience is usually a factor in salary scales, the age levels of personnel in various positions can be estimated from the present staff using historical figures to supply estimates of the rates at which personnel of different ages retire, take another job, have a leave of absence, etc.

Inflation. Inflation has already had a dramatic influence on school district budgets and is expected to be a significant factor for several years to come. While an overall inflation rate may be used, it is more precise to estimate the inflation rate separately for different goods and services. Recent federal statistics on wage and price indices can be used in making these inflation rate projections. Income, and to a lesser extent property values, may also be influenced by inflation, thereby affecting school district revenues. It should be remembered, however, that local property is only reassessed on a periodic basis, so inflationary trends in property values may not be immediately felt in changed assessments.

Since financial forecasting is a means of dealing with the future, there is uncertainty about any projections made. Especially in consideration of this uncertainty the planning process as shown in Figure 1 has several loops, or paths for repeating previous steps using knowledge gained from completing those steps initially. Essentially, the planning process involves an integration of facts and judgements to make decisions about

the future. In the following section of this paper, a financial forecasting example will be discussed to illustrate the concepts previously discussed.

4.0 A Forecasting Example*

4.1 Background

The data for this example is drawn from an actual school district in Allegheny County. The data came from past school district budgets, the district's long-range plan, and the Southwestern Pennsylvania Regional Planning Commission (SPRPC). Since the author's intentions were to provide an illustration rather than a comprehensive forecast, some of the estimates may not be as precise as a thorough planning effort would provide. However, all elements of the forecasting process, including identification of issues raised by the forecast, are represented in this example.

4.2 Methodology and Data Base

The following methodology was used for calculating expenditure forecasts for a five year period:

(1) Administration, Instruction (not including teacher salaries), Pupil Personnel Services, Health Services, Pupil Transportation, Maintenance Fixed Charges, Food Services, Student Activities, Community Services, Capital Outlay, and Outgoing Transfers were calculated by applying inflation rates to the base year (1974-75) budget for the various components of each major category. Table 1 shows such forecasts for the Operation and Maintenance of Plant category.

*This example is based on a presentation made by Richard A. Stafford (Social Systems Analyst, Westinghouse Research Laboratories) at a SHASDA workshop session, January, 1975.

Table 1

Expenditure Projections

0600 Operation and Maintenance of Plant

Operating Requirements	Year 1 (74-75)	2 (75-76)	3 (76-77)	4 (77-78)	5 (78-79)	6 (79-80)
Salaries (0611-12, 0619)	$ 794,638	$ 852,647	$ 914,890	$ 981,677	$1,053,339	$1,130,233
Oper. Supply (0621)	45,925	48,956	52,187	55,632	59,303	63,217
Fuel-Heating (0622)	106,545	119,757	134,606	151,298	170,058	191,146
Electric (0631.01)	176,827	215,906	263,621	321,881	393,017	479,874
Other Util. (0631-02,-03, -04)	56,434	58,127	59,871	61,667	63,517	65,422
Equipment (0641-43)	99,963	112,158	125,842	141,195	158,420	177,748
Services (0639)	58,450	62,717	67,295	72,208	77,479	83,135
TOTAL	$1,338,782	$1,470,267	$1,618,312	$1,785,556	$1,975,134	$2,190,774

It was assumed that the educational program offered by the school district would be of the same type and level of quality as the current program. The inflation rates for various goods and services were projections based on the past two years' wholesale price indices for the selected categories.

(2) Transportation Services for instructional purposes were assumed to be nothing as this district had decided to no longer provide this service.

(3) Debt Service figures were taken from the school district's long range plan. It was assumed that no additional debt service would be incurred over the next five years in the face of a declining enrollment.

(4) Teacher salaries were calculated by multiplying the projected number of teachers by an average cost per teacher. The number of teachers were calculated by dividing projected enrollment by a pupil/teacher ratio. Enrollment projections were taken from the district's long range plan. The pupil/teacher ratio was assumed to be constant, therefore resulting in a decreasing number of teachers over the five year planning period. The average cost per teacher was adjusted from the base year by an inflationary factor. Enrollment projections are shown in Table 2. Projection series #1 was taken from the district's long range plan. Series #2 was developed from an estimation of population and enrollment trends using SPRPC projections.

Table 2

Enrollment Assumptions (elementary and secondary):

	74-75	75-76	76-77	77-78	78-79	79-80
#1	8286	8225	8142	8061	7981	7901
#2	8286	8047	7845	7636	7419	7196

The following methodology was used for calculating revenue forecasts for a five year period:

(1) Property tax revenues were projected by assuming a constant tax millage rate and tax delinquency rate. These rates were applied to the district's total property assessed valuation which was adjusted for a growth rate of .2% per year.

(2) Income tax revenues were calculated by multiplying a constant income tax rate by total earned income. Total earned income was projected by multiplying estimated average income by the estimated number of income earners. Average income was assumed to increase 8.3% each year and the number of income earners was assumed to increase by .7% per year.

(3) State reimbursement revenues were calculated by multiplying the state aid ratio by the instructional cost per pupil by the school district's enrollment. Enrollment was taken from Table 2, projection series #1. Instructional expenditures were taken from the appropriate categories of the previously projected district expenditure forecast (categories 0100, 0200, 0300, 0600, 0800, 1000, 1100, and 1400. The state aid ratio for this school district was assumed to be constant for the five year period of these forecasts. Since the aid ratio is approximately based on the ratio of assessed valuation per pupil in a school district (wealth ratio) to the assessed valuation per pupil in Pennsylvania, this assumption implies that the district wealth ratio was expected to maintain the same relative relationship with the Pennsylvania wealth ratio.

(4) Revenues from all other sources were based on straight line projections from the previous four school district annual budgets. These

revenue sources included: realty transfer tax, delinquent taxes, tuition, interest, rent, public utility tax, miscellaneous local revenues, state health subsidy, additional state subsidies, federal sources, and incoming transfer payments.

It should be noted that the school district in the example is located in a nearly completely developed area. The estimates for changes in enrollment, assessed valuation, income, etc. may or may not represent typical circumstances for other school districts.

4.3 Alternative Forecasts

Using the methods and assumptions discussed in the previous section, a five year financial forecast was constructed. Then, in order to illustrate the planning process shown in Figure 1, three alternative forecasts were developed. These four alternatives are shown in Table 3.

Table 3

Instructional Staffing Policy Assumptions:

#1 Constant student/teacher ratio

#2 Constant number of teachers

	Enrollment Assumption	Policy Assumption
Forecast #1	#1	#1
Forecast #2	#1	#2
Forecast #3	#2	#1
Forecast #4	#2	#2

The two enrollment assumptions were previously shown in Table 2. Staffing policy #2 is a plan which a school district might consider, that is keeping the number of teachers constant despite declining enrollments in an effort to improve the school system's educational program.

The results of these forecasts are outlined in the following two tables. Table 4, illustrating Forecast #2, lists the composite projections for each of the major school expenditure accounts and for revenues except property taxes. Table 5 summarizes the results from each of the four forecasts in 1979-80. For each forecast expenditure estimations, projected revenues, and a surplus or deficit is included. In these cases, the property tax rate was assumed to be 55.5 mills (the millage rate in the initial year, 1974-75) each year. Since each of the forecasts project a deficit in the 1979-80 school year the real estate tax millage necessary to balance the school district's budget is included. (This assumes that other revenues will be received as projected.) While the results of these forecasts are significant in terms of raising school system planning issues, these particular forecasts are less precise than those produced by a thorough planning effort. However, these forecasts show some of the potential which could be realized by implementing a financial forecasting capability in local school districts.

The next section of this paper discusses additional planning steps once the initial forecasts have been completed.

5.0 Additional Planning Steps

The fiscal forecast is an intermediate step in the planning process. Once it is completed, two additional planning events can occur: (a) addi-

Table 4

Expenditure and Revenue Projections

Expenditures	Year 1 (74-75)	2 (75-76)	3 (76-77)	4 (77-78)	5 (78-79)	6 (79-80)
0100 Administration	$ 408,923	$ 440,870	$ 475,359	$ 512,596	$ 552,804	$ 596,227
0200 Instruction (except teachers)	1,967,129	2,135,020	2,319,015	2,520,829	2,742,379	2,985,806
Teacher Salaries	5,271,062	5,655,850	6,068,727	6,511,744	6,987,101	7,497,159
0300 Pupil Personnel	461,675	496,627	534,285	574,866	618,606	665,759
0400 Health	115,698	124,263	133,465	143,353	153,976	165,391
0600 Bldg. Oper. & Maint.	1,338,782	1,470,267	1,618,312	1,785,556	1,975,134	2,190,774
0800 Fixed Charges	970,196	1,086,620	1,217,014	1,363,055	1,526,622	1,709,817
0900 Food Service	27,748	29,774	31,947	34,279	36,782	39,467
1000 Student Activities	50,400	55,440	60,984	67,082	73,791	81,170
1100 Community Services	45,376	49,153	53,262	57,735	62,606	67,912
1200 Capital Outlay	113,873	127,441	142,640	159,667	178,745	200,122
1300 Debt Service	2,001,217	1,975,327	1,947,197	1,919,489	1,892,197	1,865,531
1400 Transfers	194,690	204,424	214,646	225,378	236,647	248,479
TOTAL	$12,966,770	$13,851,076	$14,816,853	$15,875,631	$17,037,390	$18,313,614
Revenue Except Prop. Tax:						
Local Revenue	$ 1,611,372	$ 1,730,142	$ 1,861,783	$ 2,001,807	$ 2,155,153	$ 2,321,689
State & Federal Revenue	2,395,332	2,439,728	2,631,710	2,854,901	3,097,344	3,366,788
TOTAL	$ 4,006,704	$ 4,169,870	$ 4,493,493	$ 4,856,708	$ 5,252,496	$ 5,688,476
Net (Revenue - Expend.)	-8,960,065	-9,681,206	-10,323,359	-11,018,923	-11,784,693	-12,625,137
Property Tax Revenue ($55.50 per $1000)	9,121,592	9,143,625	9,165,825	9,182,475	9,199,125	9,215,775
Surplus or Deficit	161,526	-537,581	-1,157,534	-1,836,448	-2,585,768	-3,409,362

Table 5

Forecast for 1979-80

	Forecasts			
	#1	#2	#3	#4
Total Expenditures	$17,869,916	$18,313,614	$17,240,541	$18,313,614
Revenues w/o Property Tax	5,612,382	5,688,476	4,288,878	4,385,776
Property Tax Revenues @ 55.5 mills	9,215,775	9,215,775	9,215,775	9,215,775
Deficit @ 55.5 Mills	3,041,758	3,409,362	3,735,887	4,712,062
Millage Necessary to Balance Budget	73.8	76.0	78.0	83.9

tional alternatives can be tested, and (b) policy implications from the forecasts must be explored. Additional alternatives in the form of new assumptions, can be tested to gauge the impact of a major factor (or factors) or to include assumptions generated by people reviewing the initial forecast.

5.1 Testing Alternatives

Many possible events can have an impact on a school district's financial position. These alternatives may be represented in the forecasting analysis via changed input assumptions and comparisons made with the original forecast. For example, there may be the possibility of a local parochial school, or schools, closing. This could be projected in terms of increased enrollment in certain grade levels and increased additional resource requirements and costs in various program areas. Other examples of possible trends which could affect the district are:

- state and federal legislation and court decisions;
- extension of educational services in the areas of pre-school and adult programs;
- school district practices relating to class size and student course loads;
- new district staffing patterns (e.g., differentiated staffing).

5.2 Policy Implications of Forecast Results

Accepting the example forecasts presented previously, the school district must either reduce its expenditures or increase its revenues, or both, in order to balance its budget. Four ways to accomplish this follow.

(1) Increase enrollment and therefore direct tuition payments or Pennsylvania subsidies;

(2) work with other groups to legislatively alter funding from the state;

(3) reduce program expenditures;

(4) prepare local taxpayers to increase the monies available for the district.

Each of these broad areas include several alternatives which can be pursued independently or jointly.

(1) Increase enrollment:

(a) attract students from non-public schools;

(b) institute adult education programs.

(2) State funding:

(a) work toward a court decision that the local property base is an improper school funding basis, state income tax revenues could then be used;

(b) change the present state subsidy formula to provide more funds.

(3) Reduce program expenditures:

(a) hold student/teacher ratio constant or increase it;

(b) avoid new fixed costs such as school buildings, equipment;

(c) try to maintain a young teaching faculty with few advanced degrees or eliminate the use of additional course credit as a salary increment;

(d) engage in joint purchasing with other agencies as much as possible;

(e) share program or capital expenses with other agencies whenever possible;

(f) secure more favorable teacher contracts through negotiations.

(4) Taxpayer preparation:

(a) provide more financial information and forecasts to taxpayers;

(b) educate citizens about the value of current school programs.

While these ideas represent a borad range of actions (varying in effort to implement and likelihood of success) they offer some possibilities for a district to achieve a balanced budget through a coming five-year period when large deficits have been forecast. The process of exploring policy implications illustrates that the planning process involves school administrators in working with things which directly affect their jobs and is a much broader process than merely making some calculations about future budgets.

6.0 Summary

The importance of the planning process was emphasized, especially as it related to administrative positions. A financial forecasting methodology was detailed as an initial step in financial planning. Four forecasts were made using a five year planning horizon and taking a local school district as a base for these projections. From these forecasts, possible other assumptions and forecasts were identified and some policy implications and administrative strategies were outlined for the sample forecasts. The deficits projected by the sample forecasts underscored the importance of long-range financial planning.

Since forecasting methodologies exist which can be readily applied to school districts, the author welcomes the opportunity to discuss the implementation of long range financial planning in school districts. Interested people should contact the Educational Management Development Center.